Jawaharlal Nehru University, New Delhi

Invitation for Expression of Interest for Mutant Azotobacter Technology

ABOUT THE TECHNOLOGY

Jawaharlal Nehru University (JNU), New Delhi has developed, a mutant of *Azotobacter chroococcum* i.e., *A. chroococcum* HKD 15 which is more efficient in nitrogen fixation and can be employed along with the chemical fertilizers to obtain good yields in agricultural crops. The technology has been developed with the funding support by Department of Biotechnology (DBT), Ministry of Science & Technology and patented jointly by JNU and DBT. The novel strain of Azotobacter has been developed using genetic engineering and hence this will be subjected to biosafety rules for further activities and environmental release. The technology needs to be scaled up and evaluated on the fields for its efficacy and biosafety foe commercial use.

A. chroococcum HKD 15 has been developed using the technique of restriction digestion, conventional recombination method. The mutant has a deletion in the *nif* L gene (the negative regulatory element of nitrogen fixation). Besides, the native promoter of the *nif* LA operon has been replaced in this mutant by a constitutive promoter. The deletion has been confirmed by detailed restriction analysis and the presence of the constitutive promoter confirmed by PCR. *A. chroococcum* HKD 15 has been characterized for its performance with respect to nitrogen fixing ability. Reduction of acetylene to ethylene has been used as a measure of nitrogenase activity. The mutant Azotobacter strain is more efficient in nitrogen fixation as seen by its ability to reduce acetylene. The mutant Azotobacter can be employed along with the chemical fertilizers to obtain good yields in agricultural crops. Pot experiments demonstrated enhanced wheat crop yield from seeds inoculated with *A. chroococcum* HKD 15 as compared to the wild type strain *A. chroococcum* CBD 15. The pot experiment (2009-10) was followed by the field trials (2010-2011) which also demonstrated enhanced yield in seeds inoculated with mutant Azotobacter strain.

PURPOSE OF THE EOI

JNU intends to license Mutant Azotobacter Technology to Indian industries for scale up, regulatory approval and commercialization. The license will be granted on nonexclusive basis as per Government of India guidelines. The Potential Licensee should meet the following requirements for consideration:

- **Strength** - should be able to invest and have experience for commercialization of products developed using genetic engineering technology, preferably in agriculture.
- **Research capacity**- should be able to scale up this technology for commercial scale. Should have state of the art research infrastructure, testing facilities and skilled manpower.
- **Marketing** - should be able to market the developed product in India.

Potential of the Technology in the Market

It is an innovative technology for efficient nitrogen fixation by mutant Azotobacter chroococcum that can be used along with the chemical fertilizers. Adoption of this technology would help in reduction of requirement of urea in agricultural crops, thereby reducing fertilizer import dependency thus aligned to realize goals of Atmanirbhar Bharat. The technology will also help in reducing environmental pollution due to excessive use of urea.

Technology status

- Significant reduction in requirement of urea by use of the mutant Azotobacter in wheat plants has been demonstrated in research experiments and a field assessment.
- Indian patent granted in 2012.

Expression of interest from Indian companies are invited for securing the license to manufacture and market the product.

Please send an expression of interest, along with preliminary information relevant to establishing the above capabilities, by email at skateriya@jnu.ac.in before extended last date (i.e., 31.10.2023) of submission of the same.

Please note:

The above invitation is not intended to bind JNU either to proceed with further discussions with any party or Potential Licensee or to appoint any party as a potential licensee.